

[Title of the document] Claims

Claim 1

A positive photosensitive resin composition comprising: (a) 100 parts by weight of a polymer that has an alkali-soluble group, (b) 1-30 parts by weight of a compound that absorbs light with the wavelength used for exposure, but is not bleached by the light, (c) 1-50 parts by weight of a quinone diazide compound, and (d) 5-500 parts by weight of particles of at least one inorganic substance selected from the group of an aluminum compound, silicon compound, tin compound, titanium compound and zirconium compound with a diameter in the range of 1 nm to 30 nm.

Claim 2

A positive photosensitive resin composition comprising: (a) 100 parts by weight of a polymer that has an alkali-soluble group, (b) 1-30 parts by weight of a compound that absorbs ultraviolet light, but is not bleached by the light, (c) 1-50 parts by weight of a quinone diazide compound, and (d) 5-500 parts by weight of particles of at least one inorganic substance selected from the group of an aluminum compound, silicon compound, tin compound, titanium compound and zirconium compound with a diameter in the range of 1 nm to 30 nm.

Claim 3

A positive photosensitive resin composition according to either Claim 1 or 2 wherein compound (b) absorbs at least one selected from the group of the i-line (365 nm), h-line (405 nm) and g-line (436 nm).

Claim 4

A positive photosensitive resin composition according to either Claim 1 or 2, wherein component (a) is novolac resin and/or resol resin.

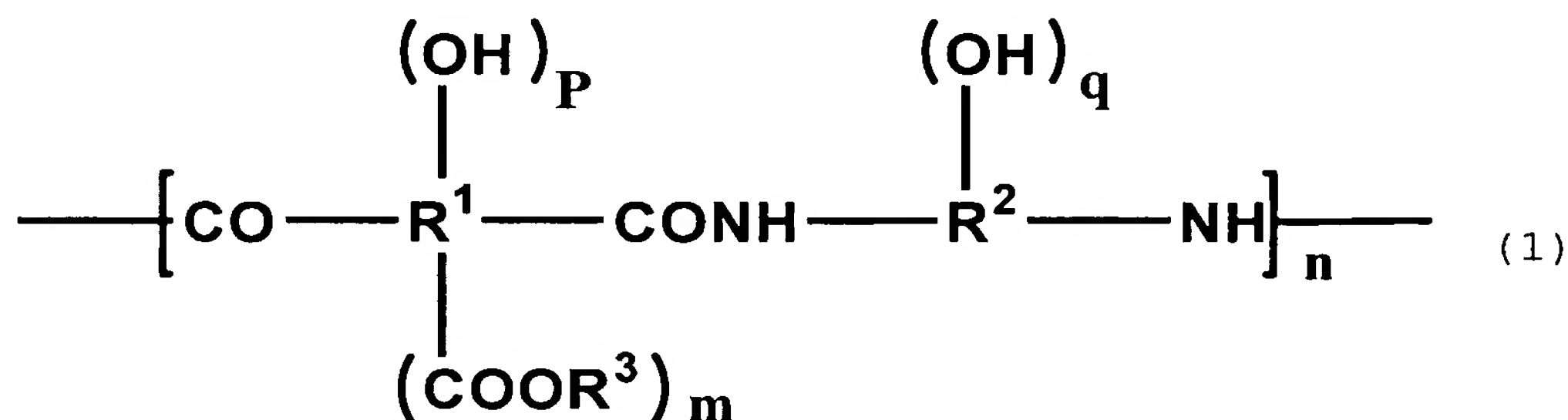
Claim 5

A positive photosensitive resin composition according to either Claim 1 or 2, wherein component (a) is a homopolymer produced from free-radical polymerizable monomers having a phenolic hydroxyl group or a carboxyl group, or a copolymer produced from said free-radical polymerizable monomers, or a copolymer produced through copolymerization of said free-radical polymerizable monomers having a phenolic hydroxyl group or a carboxyl group with other free-radical polymerizable monomers.

Claim 6

A positive photosensitive resin composition according to either Claim 1 or 2, wherein component (a) is a polymer that mainly comprises a structural unit as represented by general formula (1).

[Chemical compound 1]



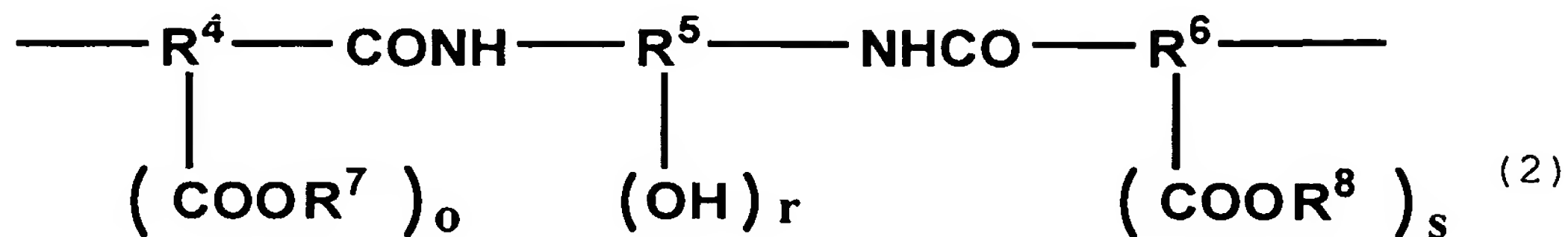
In the formula,  $\text{R}^1$  denotes a bivalent to octavalent organic group with two or more carbon atoms,  $\text{R}^2$  a bivalent to hexavalent organic group with two or more carbon atoms, and  $\text{R}^3$  a hydrogen atom or an organic group with 1-20 carbon atoms. And,  $n$  indicates an integer in the range of 10 to 100000,  $m$  an integer in the range of 0 to 2, and  $p$  and  $q$  an integer in the range of 0 to 4 that meet the following equation:  $p+q \geq 0$ .

Claim 7

A positive photosensitive resin composition according to either

Claim 1 or 2, wherein  $R^1 (COOR^3)_m (OH)_p$  in general formula (1) is represented by general formula (2).

[Chemical compound 2]

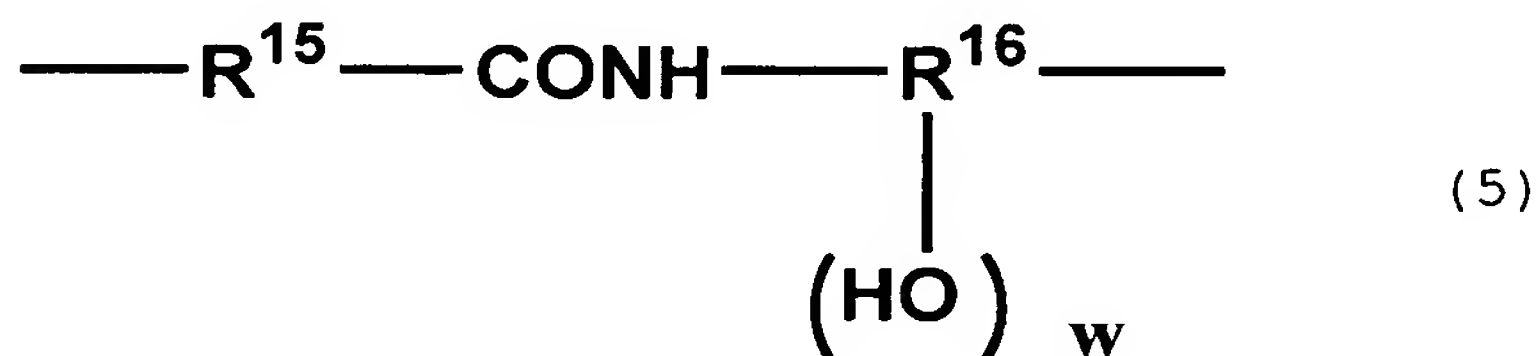
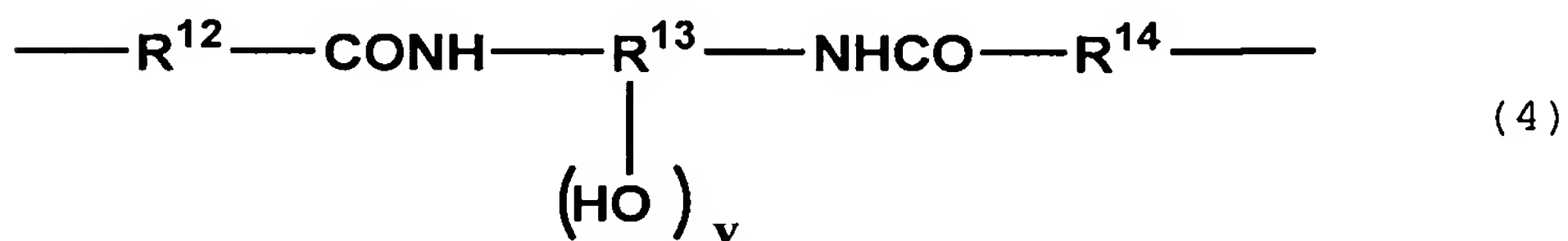
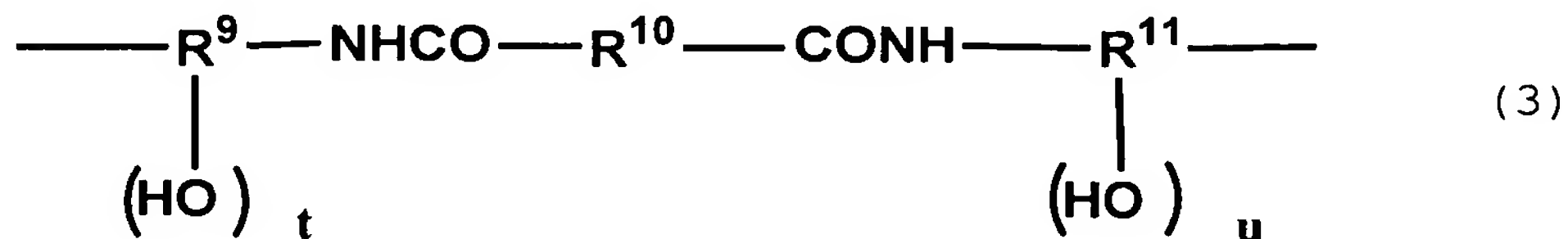


$R^4$  and  $R^6$  represent a bivalent to quadrivalent organic group with 2-20 carbon atoms,  $R^5$  a trivalent to hexavalent organic group with a hydroxyl group and 3-20 carbon atoms, and  $R^7$  and  $R^8$  either a hydrogen or an organic group with 1-20 carbon atoms. In addition,  $o$  and  $s$  denote an integer in the range of 0 to 2, and  $r$  shows an integer in the range of 1 to 4.

Claim 8

A positive photosensitive resin composition according to either Claim 1 or 2, wherein  $R^2 (OH)_q$  in general formula (1) is at least one unit represented by any of general formulas (3)-(5).

[Chemical compound 3]



R<sup>9</sup> and R<sup>11</sup> represent a trivalent to quadrivalent organic group that comprises a hydroxyl group and 2-20 carbon atoms, R<sup>10</sup> a bivalent organic group comprising 2-30 carbon atoms, and t and u an integer of 1 or 2. R<sup>12</sup> and R<sup>14</sup> represent a bivalent organic group that comprises 2-20 carbon atoms, R<sup>13</sup> a trivalent to hexavalent organic group that comprises a hydroxyl group and 3-20 carbon atoms, and v an integer of 1-4. R<sup>15</sup> represents a bivalent organic group that comprises 2-20 carbon atoms, R<sup>16</sup> a trivalent to hexavalent organic group that comprises a hydroxyl group and 3-20 carbon atoms, and w an integer of 1-4.

Claim 9

A positive photosensitive resin composition according to either Claim 1 or 2, wherein absorption at wavelengths of 400 to 700 nm originating in the compound used as component (b) does not increase during heating at 130 to 400°C.

Claim 10

A positive photosensitive resin composition according to either Claim 1 or 2, wherein component (b) comprises one or more compounds selected from the group of coumarin derivatives, benzotriazole derivatives and hydroxylbenzophenone derivatives.

Claim 11

A positive photosensitive resin composition according to either Claim 1 or 2, wherein the transmittance of photosensitive resin composition film at 365 to 436 nm is in the range of 20-70% per 1.2 μm.

Claim 12

A relief pattern of photosensitive resin produced by exposing a positive photosensitive resin composition according to any of Claims 1-11 to ultraviolet light and subsequently heating it.

Claim 13

A relief pattern of heat resistant resin comprising dots with a size of 1  $\mu\text{m}$  to 10  $\mu\text{m}$  arranged grid-like at intervals of 0.1  $\mu\text{m}$  to 1.0  $\mu\text{m}$ , wherein each dot has a light transmittance at 400 nm of 80% or more per  $\mu\text{m}$  and a taper angle of  $55^\circ$  or less.

Claim 14

A solid-state image sensor produced from a relief pattern of photosensitive resin according to Claim 12.

Claim 15

A solid-state image sensor produced from a relief pattern of heat-resistant resin according to Claim 13.